

On a family of models occuring in mathematical modelling for biology. Examples in neuroscience.

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Abstract:

In this talk, I will present some properties of stochastic hybrid models which involve a mixture of deterministic and stochastic evolution. I will give examples of different settings coming from biology where models in this family are used. In particular, in mathematical modelling in neuroscience such models describe a neuron with a finite number of channels displaying a stochastic gating mechanism as well as the activity of neural fields. In this context limit theorems can be proved with respect to size parameters or to time scales ratios. These limit theorems can be applied to build approximations.